UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/864,813	05/24/2001	Hiroshi Itoh	01024	2580

23165 7590 02/05/2003

ROBERT J JACOBSON PA
650 BRIMHALL STREET SOUTH
ST PAUL, MN 551161511

EXAMINER
WYROZEBSKI LEE, KATARZYNA I

ART UNIT	PAPER NUMBER
1714	7

DATE MAILED: 02/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/864,813	Applicant(s) ITOH ET AL.
	Examiner Katarzyna Wyrozebski Lee	Art Unit 1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United Stated before the invention by the applicant or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under article 21(2) of such treaty in the English language.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 5, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Ihm (US 5,484,861).

The prior art of Ihm discloses degradable composition comprising aromatic polyester and aliphatic polyester wherein the two polyesters are reacted together in order to make degradable polymer.

Example 1 of the prior art of Ihm (col. 4) discloses 5 parts by weight of PET and 3 parts by weight of poly(3-hydroxybutyrate) having number average molecular weight of 37,000. The two polymers were heated to 170°C, reacted and crude product was precipitated in excess of methanol.

In example 4 (col. 5) of the prior art of Ihm, aliphatic polyester has number average molecular weight of 280,000, in example 7 (col. 6) 1900,000. The ratio of the two polymers is 5 pbw to 5pbw, which would translate to 50/50.

The reaction of the aromatic and aliphatic polyesters would inherently form a block, since the two polyesters would be expected to react in the same manner due to having the same functional groups.

Although the prior art of Ihm does not say that the aromatic polyester used is recycled aromatic polyester, use of recycled polyesters can be easily inferred because the goal of the prior art of Ihm is to minimize plastic waste and forming degradable polymers.

In the light of the above disclosure Ihm anticipated requirements of claims rejected below.

3. Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by JP 081166.

The prior art of JP 081166 discloses process of recycling PET by reacting it with linear copolymer of anhydrous dicarboxylic acid and ethylene oxide (SA-EO). The two polymers are reacted in biaxial extruder *via* ester exchange at a temperature range of 260-320°C, which melts the components [0027]. Resulting polymer is biodegradable.

The source of the PET includes PET bottles or container [0003] and PET polymer utilized has number average molecular weight of 10,000-30,000 [0015].

The linear copolymer includes specifically succinic anhydride and ethylene oxide [0016] wherein the number average molecular weight is 2,000-20,000 [0019]. The polymerization of

the linear polyester of JP 081166 is formed by ring opening polymerization of the two components.

According to Table 2 [0052], the ratios of the PET to SA-EO are: 50/50, 70/30, 60/40, 80/20. According to Table 1 [0051] the ratios are also 40/60 and 20/80. The number average molecular weights are in a range of 21,000-38,3000.

The prior art JP 081166 is silent with respect to the block form of the formed copolymer, however, such arrangement would be inherent for the polymer of the prior art. The inherency of the block arrangement results from the fact that both the aromatic polyester and linear polyester are the same as those required by the present invention and thereby they would react in the same manner during the transesterification.

In the light of the above disclosure JP 081166 anticipated the requirements of claims rejected above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 5, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ihm (US 5,484,861).

The prior art of Ihm discloses degradable composition comprising aromatic polyester and aliphatic polyester wherein the two polyesters are reacted together in order to make degradable polymer.

Example 1 of the prior art of Ihm (col. 4) discloses 5 parts by weight of PET and 3 parts by weight of poly(3-hydroxybutyrate) having number average molecular weight of 37,000. The

two polymers were heated to 170°C, reacted and crude product was precipitated in excess of methanol.

In example 4 (col. 5) of the prior art of Ihm, aliphatic polyester has number average molecular weight of 280,000, in example 7 (col. 6) 1900,000. The ratio of the two polymers is 5 pbw to 5pbw, which would translate to 50/50.

The reaction of the aromatic and aliphatic polyesters would intrinsically form a block, since the two polyesters would be expected to react in the same manner due to having the same functional groups.

The polymer of the prior art of Ihm is degradable and using of such film would minimize waste.

Although the prior art of Ihm does not say that the aromatic polyester used is recycled aromatic polyester, it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize recycled polyester, since such modification would also add to reducing plastic waste.

8. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (JP 09328554) in view of evidence given in JP 081166.

The prior art of Yamamoto discloses composition comprising reacted aromatic polyester and aliphatic polyester. Newly formed polymer is flexible, transparent and does not bleed plasticizer.

The aliphatic ester of Yamamoto has number average molecular weight of 10,000-100,000 [0011]. The aliphatic polyester according to Abstract of Yamamoto is formed from succinic anhydride and cyclic ether composed mainly of ethylene oxide *via* ring opening polymerization.

The amount in which the two polyesters are used is in a range of 95-5 wt% to 5-95 wt % (Abstract).

The process of making the resulting polymer is by transesterification of the melted components at 150°C under nitrogen (Abstract).

Aromatic polyester according to the examples of the prior art of Yamamoto is PET (Table 1 [0010] and Table 2 [0011].

Although the prior art of Yamamoto does not disclose the block arrangement of the formed copolymer such would be intrinsic result. The polymeric components in both prior art of Yamamoto and the present invention are the same and they react in the same way, therefore the resulting polymer will obviously be the same in sterics as well.

The prior art of Yamamoto also does not disclose the aspect of biodegradability of the resulting polymer. However, in view of evidence given in JP 081166, the polymer of Yamamoto will be biodegradable for the following reason. The polymer of Yamamoto is formed from the same components and also *via* transesterification therefore the property such as biodegradability would be an intrinsic property of the polymeric composition. In view of the above utilizing recycled products would be an obvious modification.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize the prior art of Yamamoto and thereby

obtain the claimed invention. The prior art of Yamamoto would also form biodegradable polymer, whereas utilizing waste product would further minimize already existing waste.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski Lee whose telephone number is (703) 306-5875. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (703) 306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Katarzyna Wyrozebski Lee
KIWL
January 27, 2003